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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/574,805

04/05/2006

Koichi Nagata

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12/23/2008

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EXAMINER

SAHA, BIJAY S

ART UNIT

PAPER NUMBER

4181

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/574,805	Applicant(s) NAGATA, KOICHI	
	Examiner BIJAY SAHA	Art Unit 4181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-22,29,31,33 and 35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 19-22,29,31,33 and 35 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 23-28,30,32,34 and 36-39 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/5/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election acknowledged

Applicant's election **without** traverse of group I invention claims 19-22, 29, 31, 33 and 35 in the reply filed on 11/10/2008 is acknowledged.

Therefore, **the restriction requirement is deemed to be proper. And thus, restriction requirement previously issued is maintained and made FINAL.**

Group II claims 23-28, 30, 32, 34 and 36 and Group III claims 37-39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group of invention, there being no allowable generic or linking claim.

Status of Application

The elected claims 19-22, 29, 31, 33 and 35 are pending and presented for the examination.

Information Disclosure Statement

Since all the references found in search report is properly cited in PTO-1449, the column citing search report had been crossed the line thru since it is not a reference but a collection of references. All the references cited in PTO-1449 are considered and properly acknowledged.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the

differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tour et al US 5,904,852 (hereafter US '852) in view of Konarev et al (Mol Complexes, Jour Solid State., 168, 2002, 474-485) (hereafter JSC '474).

US '852 teaches a process for separating C60, C70 and higher fullerenes greater than C70 in an organic solvent as the mobile phase and a mixture of fullerenes dissolved in the mobile phase (Abstract, Col 3, line 49, claim 1).

US '852 does not teach separating C60, C70 (required by **claim 19**) and higher fullerenes utilizing amines (**claim 20**).

Regarding **claim 19**, JSC '474 teaches the formation of a complex of fullerenes with amines containing two or more nitrogen atoms where fullerene complexes with amine were synthesized by solvent evaporation of fullerene and corresponding amine (page 476). At the time of invention it would have been obvious to a person of ordinary skill to perform the fullerene separation (US '852 teaching) via the route of amine

complex formation (JSC '474 teaching). The motivation for doing so would have been to enhance the selectivity of the fullerene type associated with separation efficiency when mixture of C60, C70 and higher fullerenes greater than C70 are present since, as in most organic chemistry reactions, fullerene complex formation is dependent upon the amine and the type of fullerene.

Regarding **claim 20**, JSC '474 discloses solvents such as chlorobenzene and benzene (Page 476). It is expected that the solubility of the fullerene complex would be solvent dependent and a specific fullerene complex out of C60, C70 and higher fullerenes and amines would be insoluble in a solvent.

Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over US '852 in view of JSC '474 as applied to **claims 19-20**, further in view of Bhasikuttan et al (Interaction of Triplet State, Journal of Photochemistry and Photobiology, 143, 2001, 17-21) (hereafter JPP '17).

US'852 in view of Konarev et al's teaching is mentioned above, earlier 103 rejection.

Regarding **claim 21**, the teaching of US'852 in view of Konarev et al's does not explicitly teach dissociation of fullerene.

JPP '17 discloses dissociation of fullerene complex into fullerene and amine (reaction 12, page 20).

At the time of invention it would have been obvious to a person of ordinary skill to

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to perform the fullerene separation (US '852 teaching) via the route of amine complex formation (JSC '474 teaching) and subsequent complex dissociation (JPP '17 teaching). The suggestion or motivation for doing so would have been to separate the amine and C60, C70 and higher fullerenes complex via the teachings of JPP '17.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over US '852 in view of JSC '474 and JPP '17 as applied to **claims 19-21**, further in view of Choudhury et al WO2002/079142 (hereafter WO '142).

US'852 in view of JSC '474 and JPP '17 teaching is mentioned above, earlier 103 rejection.

Regarding **claim 22**, US'852 in view of JSC '474 and JPP '17 teaching does not explicitly teach the dissociation of fullerene complex by acid.

WO '142 teaches reaction of amines and acids including carboxylic acid and hydrochloric acid (Page 1, para 1 and 2).

At the time of invention it would have been obvious to a person of ordinary skill to perform the fullerene separation (US '852 teaching) via the route of amine complex formation (JSC '474 teaching) and subsequent complex dissociation (WO '142 teaching). The suggestion or motivation for doing so would have been to dissociate the fullerene complex by acid treatment which is a more convenient method of complex dissociation.

Claims 29, 31, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tour et al US 5,904,852 (hereafter US '852) and Konarev et al (Mol Complexes, Jour Solid State., 168, 2002, 474-485) (hereafter JSC '474) in view of Nakamura et al US 6,765,098 (hereafter US '098).

US'852 in view of Konarev et al's teaching is mentioned above, earlier 103 rejection.

Regarding **claim 29**, Teachings of US '852 in view of Konarev et al's have been delineated above.

US '098 teaches multiple amine compounds that are utilized to form the complexes with fullerenes where two nitrogen atoms in the amine are bonded through one carbon atom of the alkylene group (Col 6 structure shown in lines 10-15).

At the time of invention it would have been obvious to a person of ordinary skill to perform the fullerene separation (US '852 teaching) via the route of amine complex formation (JSC '474 teaching) utilizing the art of multiple amine compounds for synthesizing fullerene complexes. The suggestion or motivation for doing so would have been to form fullerene complex for multiple application and utilize them in the complexed form in various areas of technology other than just the separation of fullerenes.

Regarding **claim 31**, US '098 discloses two nitrogen atoms are bonded via alkyl group A that contains carbon (Col 6 lines 35-40). Although nitrogen in the example is

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attached to two groups R1 and R2 via single bonds, an amidine structure may have only one functional group attached to the nitrogen via a double bond. A nitrogen atom may be attached to a carbon via a double bond by having only one functional group attached to the nitrogen atom.

Regarding **claims 33 and 35**, JSC '474 discloses multiple molecular amine structure. It is expected that any of the structure discussed (Page 475 Scheme 1) can be enable by one skilled in the pertinent art [**MPEP 2164.01**]; for example, Te in the EPTA (Scheme 1, page 475) can be replaced by another N by those skilled in the art and would have the same expectation of results.

Summary

The **claims 19-22, 29, 31, 33 and 35** are rejected.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BIJAY SAHA whose telephone number is (571)270-5781. The examiner can normally be reached on Monday- Friday 8:00 a.m. EST - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571 272 0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BIJAY SAHA/
Examiner, Art Unit 4181

12/10/2008